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Specification and Drawings, as originally filed, with Application for Patent Serial No:
2,300,598, on March 14, 2000, by **CENTRIC-SAFE HAVEN INC.**, assignee of
Malcolm Jefferson, Terrence Back and Brian Barnwell, for "Bicycle Seat with Telescopic
Support Bar".

Quincy P. Smith
Agent certificateur/Certifying Officer

May 4, 2004

Date

Canada

(CIPO 68)
04-09-02

OPIC  CIPO

TITLE OF THE INVENTION

BICYCLE SEAT WITH TELESCOPIC SUPPORT BAR

BACKGROUND OF THE INVENTION

5 This invention related to a child carrier bicycle seat telescopic support
bar for carrying a passenger seat situated between the saddle and the handlebars.

DESCRIPTION OF THE PRIOR ART

10 Support systems for passenger seats mounted between the saddle
and handlebars of an adult bicycle have been suggested previously in the art, but
all the prior art fails to disclose the structure of the support bar described and
claimed herein, and so fails to achieve the advantages associated with the present
invention. No prior art centre mounted seat support bar discloses clamped
engagement points at both the front post and seat post of the adult bicycle, instead
either (1) utilizing engagement points at the seat tube (clamped) and top tube
(gravity); (2) utilizing only one engagement point at either the seat tube or top tube
15 of the adult bicycle; or (3) utilizing engagement points at the top tube (gravity) and
seat post (clamped).

The present invention, by utilizing clamped engagement with the front
post and seat post together with a telescopic arrangement which can be adjusted

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and bolted tightly so the bar exactly fits the required bicycle, can be used on any bicycle, whether the top tube is horizontal and straight with various tube diameters or shapes, straight with various diameters or shapes of the top tube but sloping downwards from the front post to the seat post; or the tube presents a curved
5 configuration in the vertical direction; and notwithstanding the great variety of bicycle front post diameters found in today's bicycles, the yoke and clamp of the bar engaging the bicycle front post accommodate all post diameters presently known.

The U.S. Patent 5850958 describes a propped cantilever support bar,
10 which extends from the bicycle seat post rearwards with props from the end of the cantilever extending down to the bicycle rear struts. Whilst this Patent promulgates a seat situated behind the bicycle saddle, it is possible for that structure to be pivoted 180 degrees in which case the supporting props would have to engage the bicycle top tube leaving no room for the proposed shock absorbers. With or
15 without props, with the cantilever behind or in front of the saddle this structure would be susceptible to lateral rotation in the event of the bicycle falling sideways to the ground with subsequent loss of stability.

The U.S. Patent 5330215 teaches a propped cantilever support
20 system engaged by clamping on the bicycle seat tube and a gravity engagement to the top tube which arrangement is susceptible to disarrangement in the event of the bicycle falling sideways to the ground. The gravity engagement cutout will not fit the great variety of top tube diameters and shapes found in today's bicycles and the allowance for brake and derailleur cables is insufficient for the various positions

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adopted for those cables in today's bicycles. The preferred seat width of 13" is too wide for adult rider comfort especially since the preferred position for the gravity engagement is 5" behind the front post of the bicycle which pushes the seat right up against the adult rider.

5 The U.S. Patent 4305532 proposes a support bar which engages the bicycle front post and seat post with open ended yokes that would not retain stability when carrying a live load bringing to bear eccentric downward forces on the bar. Furthermore the great variety of bicycle front post diameters found today makes it possible to fit the bar to only a very limited number of bicycles. The lack
10 of substantial fixing devices makes this structure unstable in the event of the bicycle falling sideways to the ground and under the constraint of an eccentric live load.

 The U.S. patent 4919479 teaches a child carrier bicycle seat integral with a support bar that engages the bicycle with an open sided yoke at the bicycle
15 seat post relying entirely on gravity for positioning with no clamping restraint to withstand forces other than downwards and at the forward end of the integral bar, engagement with the bicycle is obtained by a clamp which will not fit most of today's bicycle top tubes and which will interfere with a great number of today's brake and derailleur cable arrangements. The seat is in a fixed position relative to
20 the bar, which makes adjustment to various sized bicycles impossible. Even if the forward clamp on the integral bar firmly engaged the bicycle, the gravity controlled open sided yoke at the rear, engaging the seat post, would render the structure unstable in the event of the bicycle falling laterally to the ground.

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The U.S. Patent 5639001 proposes a support bar with hooks to engage the head post and seat tube of the bicycle with a telescopic bar that clamps the two hooks in tandem to the bicycle. The bar can be adjusted in length to be locked in position through matching holes in the two sliding members of the bar, which limits the adaptability of the sliding bar to the varying distances found between the bicycle front post and seat post on today's bicycles since those varying distances would not necessarily match the incremental variations possible with the hold positions in the bar. Furthermore, the hooks are configured to withstand an essentially eccentric load from a given direction, whereas in the matter of a bar to carry a child's bicycle seat, the load is essentially over the top of the bar with eccentric downward forces to be expected on both sides of the bar. The hooks and braces in the proposed bar under U.S. Patent 5639001 would greatly interfere with brake and derailleur cables and the bar would prove unstable in the event of the bicycle falling sideways to the ground. Furthermore the bar finds its natural resting points on the bicycle by gravity and on today's bicycles this would result in the bar being far from horizontal on many bicycles where the top of the seat tube is lower than the meeting point between top tube and front post, which is unacceptable for a bar carrying a child carrier seat that must be essentially horizontal to the ground.

The present invention offers distinct advantages over all prior art in that the slotted configuration of the sliding bars allows for the bar to be clamped at an infinite variety of positions, ensuring a good fit to all bicycles; that the variable clamp at the bicycle front post and adjustable clamp at the seat post makes

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possible the horizontal positioning of the support bar with substantial clamping arrangements at each engagement point on the bicycle, as well as at the slot clamping position on the bar, thus ensuring stability under all conditions of the live load forces as well as those forces created by the bicycle falling sideways to the ground. The U-shaped configuration of the sliding telescopic bar ensures no impediment of brake and derailleurs cables and the adjustability of the clamps engaging the bicycle front post and seat post allows for snug fitting to all known present day diameters of those posts. Being remote from the top tube, the efficiency of the telescopic bar is not adversely affected by the various diameters and shapes of today's top tubes. Furthermore the bar can be permanently fixed to the bicycle since the seat can be quickly fixed on or removed from the bar by means remote from the arrangements for fixing the bar to the bicycle. Thus it is possible for a family to fix bars to a number of bicycles making it a matter of moments to transfer the child carrier bicycle seat from one bicycle to another.

SUMMARY OF THE INVENTION

The objective of the invention is to provide an improved support bar for a centre-mounted passenger seat, that can be adjusted to fit all known bicycles with emphasis on the highest degree of safety at all fixing points, which may entail a longer fixing procedure than other systems, but which ensures the integrity of the system with regard to safety is not compromised when judged by the standards of safety laid down by ASTM.

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Accordingly, the present invention encompasses a telescopic sliding U-shaped two-piece support for engagement with the bicycle at the front post and seat post of the bicycle. The front outer bar contains an integral threaded hole to take an Acorn-headed bolt. The Acorn-headed bolt passes through a mating washer and a prepared slot in a separately manufactured plastic passenger seat and thence through the threaded hole in the bar, thus allowing for the linear positioning of the seat on the bar with a substantial clamping arrangement to hold the seat to the bar. This seat clamping arrangement makes it possible for a family to fix bars to a number of bicycles so that the seat can be speedily transferred from one bicycle to another, or for a seat-carrying bicycle to be quickly prepared for unimpeded use of the bicycle by the adult rider alone without the presence of the seat. The aforesaid outer bar also contains a hole which mates with a slot in the rear inner bar through both of which passes a bolt with washer and nut allowing for the clamping together of the outer and inner bars in a infinite variety of positions giving a minimum total bar length of 19" and a maximum total bar length of 22 $\frac{3}{4}$ " such that the total bar is able to fit snugly between the front post and seat post of all known adult bicycle sizes. The front clamping arrangement of the bar preferably comprises an open yoke dimensioned to accommodate all known diameters of front posts, with a clamping bracket situated on the opposite side of the front post, held to the yoke by threaded bolts and lock nuts. The rear clamp preferably comprises a transverse bolt in front of the seat post with another behind the seat post both of which pass through a spacer sleeve placed between the two arms of the yoke which ensures the yoke is not deformed by over-tightening of the nuts

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wound onto the aforesaid bolts. On each yoke arm, between the two transverse bolts is placed a compressive spacer block to ensure the snug fit of the varying diameters of seat posts found in today's adult bicycles. Thus the rear clamp can be frictionally fixed to the seat post ensuring the horizontal positioning of the total bar and the ability of the clamp to withstand all expected external forces. The U-shaped configuration of the essentially SAE 1010 Steel support bar ensures the ability to withstand all expected external forces with a 5:1 safety factor, and allows the support bar to be kept clear of the brake and derailleur cables on the bicycle even with the great variety of positions adopted for such cables on today's bicycles.

Front and rear clamping arrangements allow for bolts, washers and nuts to be tightened such that no matter in which direction the external force, or how eccentric to the bar is that force, there will be no movement of the bar, thus maintaining its horizontal positioning on the bicycle and totally withstanding any lateral forces induced by the bicycle falling sideways to the ground. The support bar as designated will meet all requirements of the relevant ASTM Standards, whereas all known prior art will fail in that endeavor. Other objectives, features and advantages of the invention will become readily apparent from the following detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows in perspective from the rear the preferred two-piece

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support bar with front and rear clamps including bolts, nuts, washers and spacers with a separate child carrier seat positioned forward on it and the bar fully extended.

Fig. 2 is as Fig. 1 but with the seat positioned rearward on the bar.

5 Fig. 3 is as Fig. 1 but with the bar fully retracted.

Fig. 4 is as Fig. 2 but with bar fully retracted.

Fig. 5 is as Fig. 1 but viewed from the front.

Fig. 6 is as Fig. 2 but viewed from the front.

Fig. 7 is as Fig. 3 but viewed from the front.

10 Fig. 8 is as Fig. 4 but viewed from the front.

Fig. 9 shows a side view of the preferred two-piece bar to illustrate the fixing to it of a separate child carrier seat positioned rearward on the bar with the bar fully extended and showing the arrangement to clamp the two bar sections together, to clamp the front end of the bar to the bicycle front post, and to clamp
15 the rear end of the bar to the bicycle seat post.

Fig. 10 is as Fig. 9 but with the seat positioned forward on the bar.

Fig. 11 is a Fig. 10 but with bar fully retracted.

Fig. 12 is as Fig. 9 but with bar fully retracted.

Fig. 13 is a bottom view.

20 Fig. 14 is a top view.

Fig. 15 is a sectional view.

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DETAILED DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a separate child carrier seat 1, especially designed to fit a telescopic support bar, comprising a forward section 2, into which fits a rear section 3, both made in U-shaped SAE 1010 steel, with a yoke 4, that engages the bicycle front post 5, and which is held to that post by a front bracket 6 situate on the opposite side of the bicycle post 5 and clamped to the yoke 4 by two bolts 7, each with three lock nuts 8, such that varying diameters of bicycle front posts 5 can be accommodated. Integral with the forward outer bar 2 is a threaded hold 9 to take an Acorn-headed bolt 12. The Acorn-headed bolt 12 is supplied with a matching washer 11 which sits on top of a slot 10 in the passenger seat 1 with the Acorn-headed bolt 12 passing through the washer 11 and slot 10 and subsequently screws into the hold 9 to enable the seat 1 to be firmly clamped to the bar section 2 and further allowing for varied linear positioning of the seat 1 on the bar section 2 so the seat 1 may be suitably positioned between the bicycle handlebars and saddle notwithstanding the great variety of distances found between those two points on today's adult bicycles. The aforesaid seat 1 clamping arrangement allows for the speedy placement and removal of the passenger seat 1 on and off the bar 2/3. To the rear of forward bar section 2 is a hole 13 to take a bolt 14 that passes through hole 13 and slot 15 in the rear section 3 to clamp the two bar sections together by means of a washer 16 and nut 17, which slot 15 allows for the two bar sections to be clamped in varying positions from fully extended bar to fully retracted bar, thus enabling the support bar 2/3 to fit all known sizes of adult

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bicycles, both male and female. The rear clamp 18 on the rear section 3 contains aligned holes 19 on both halves of the clamp 18 such that a clamping bolt 20 can pass through the holes 19, and centrally placed spacers 21, to lock nuts 22 on the other side, with adjustable compressible spacer pads 21 on both halves of yoke 18 such that varying diameters of seat post 24 can be accommodated with the yoke 18 being frictionally held to the seat post 24 by the judicious tightening of the lock nuts 22, such that the total assembly 2/3 is firmly held in a horizontal position, and able to withstand all expected external forces no matter from which direction and ensuring no impediment of the brake and derailleur cables on the bicycle.

Fig 1 shows the seat 1 in the forward position with the bar 2/3 fully extended.

Fig 2 illustrates the functions shown in Fig 1 but with the seat 1 positioned rearwards and the bar 2/3 in the fully extended position.

Fig 3 is as Fig 1 but with the bar 2/3 fully retracted.

Fig. 4 is as Fig 2 but with the bar 2/3 fully retracted.

Fig. 5 is as Fig 1 but viewed from the front and shows a prepared slot 25 in the seat 1 to allow for the bolt head 14 to fit within the seat 1.

Fig. 6 is as Fig 2 but viewed from the front and shows a prepared slot 25 in the seat 1 to allow for the bolt head 14 to fit within the seat 1.

Fig. 7 is as fig 3 but viewed from the front and shows a prepared slot 25 in the seat 1 to allow for the bolt head 14 to fit within the seat 1.

Fig 8 is as fig 4 but viewed from the front and shows a prepared slot 25 in the seat 1 to allow for the bolt head 14 to fit within the seat 1.

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Fig 9 is a side view with seat 1 positioned rearward and bar 2/3 fully extended.

Fig. 10 is a Fig 9 but with seat 1 positioned forward.

Fig. 11 is a Fig 10 but with bar 2/3 fully retracted.

5 Fig 12 is as Fig 9 but with bar 2/3 fully retracted.

Fig 13 is a bottom view, Fig 14 a top view and Fig 15 a sectional view.

It is understood that the invention is not limited to the embodiments shown and described above, and that alternative embodiments, modifications or equivalents which may be included in the scope and spirit of the invention, will be
10 covered by the following claims.

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WE CLAIM:

1. A telescopic bar for carrying a child carrier bicycle seat and attaching onto a bicycle, comprising:

A front yoke with clamping bracket to engage the bicycle front post;

A rear yoke with clamping bolts to engage the bicycle seat post;

An adjustable bar extending between the front yoke and rear yoke which bar adjusts to vary the distance between the front yoke and rear yoke; and

An integral threaded hole on the forward bar, attached near the front yoke to allow for firmly fixing a child carrier seat to the bar by means of a matching bolt.

2. The telescopic support bar as described in Claim 1 further comprising;

A pair of compressible spacers to attach to the rear yoke to accommodate varying diameters of seat post and effectively deter the bar from twisting about its longitudinal axis;

A pair of tubular spacers situate between the extending arms of the rear yoke to effectively stop undue inward deflection of the arms when tightening the holding bolts; and

A slot in the rear section of the bar mating with a hole in the front section of the bar to receive a clamping bolt, washer and nut to clamp the two sections together at the required position such that the front and rear yokes

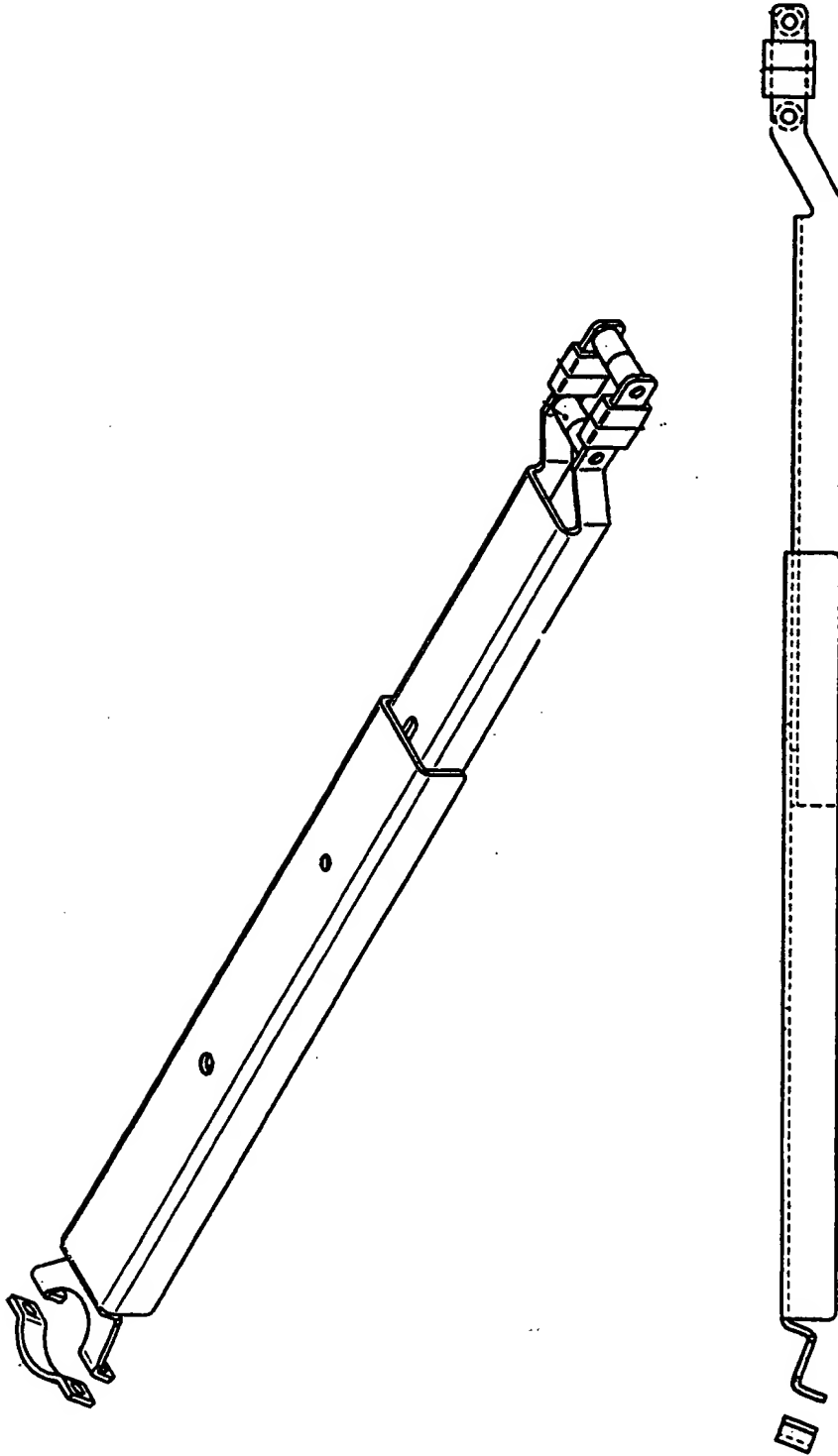
- 13 -

engage the front post and seat post of the bicycle in a manner to ensure no movement of the bar during use.

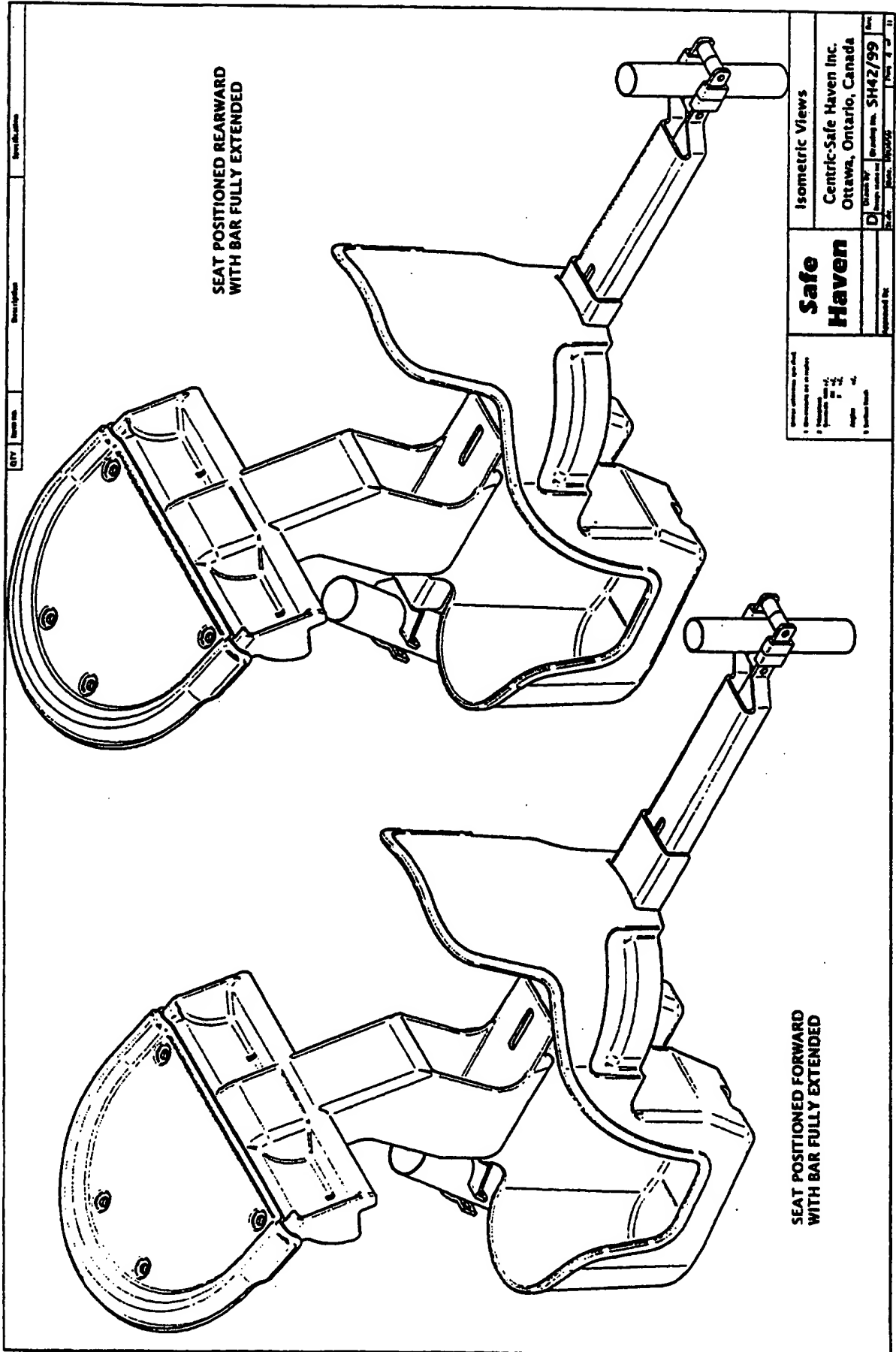
3. A telescopic support bar as described in Claim 2 with means whereby the bar can be positioned horizontally on either a male or female bicycle and locked in that position without obstructing the bicycle brake and derailleur cables, and which bar can accommodate all known diameters and configurations of bicycle top tube by essentially keeping clear of the aforesaid top tube.

4. A telescopic support bar as described in Claim 1 whereby the front yoke is frictionally held to the bicycle front post by a clamping bracket on the opposite side of the front post, and held to the yoke, by clamping bolts and distance-adjusting lock nuts to allow the yoke to fit all known varying diameters of bicycle front post and furthermore to ensure no movement of the yoke during use.

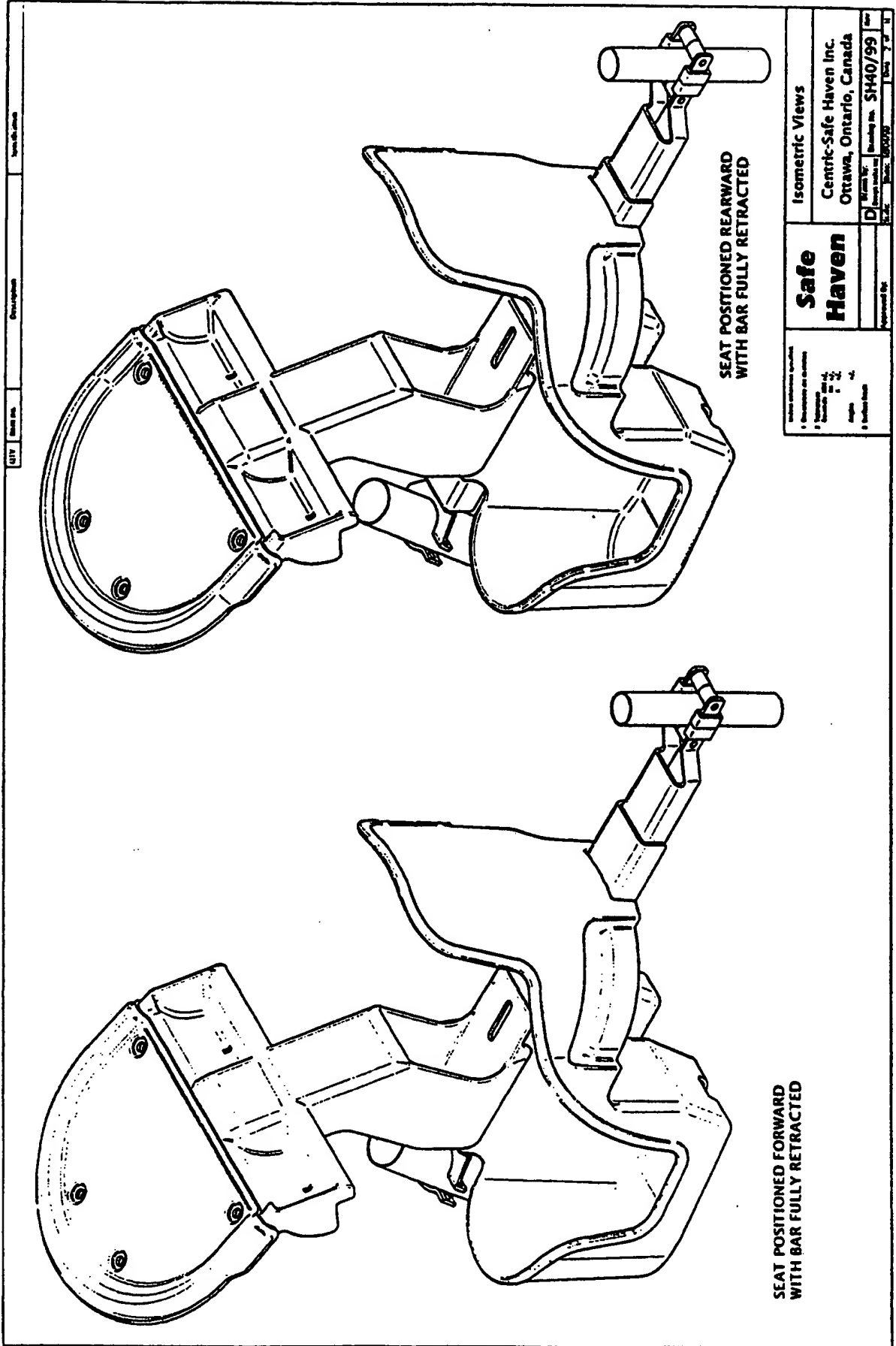
5. A telescopic bar as described in Claim 1 whereby means are provided for the speedy attachment to the bar of a passenger seat, with likewise speedy detachment of the seat from the bar, such that the total bar can be permanently attached to a bicycle thus allowing for unimpeded use of the bicycle without the seat in place, and the rapid transfer of the seat from one bicycle to another similarly equipped with the support bar.

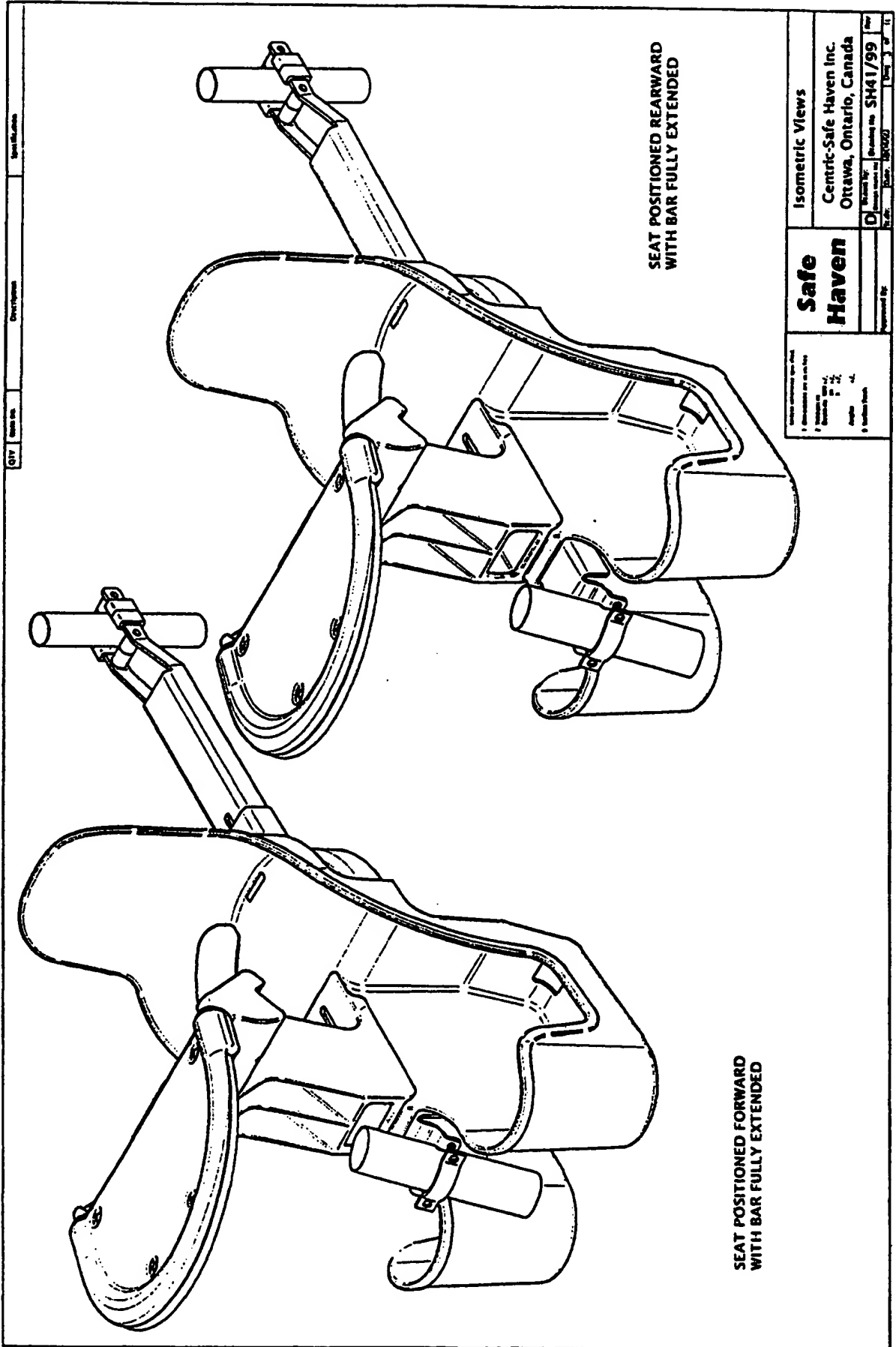


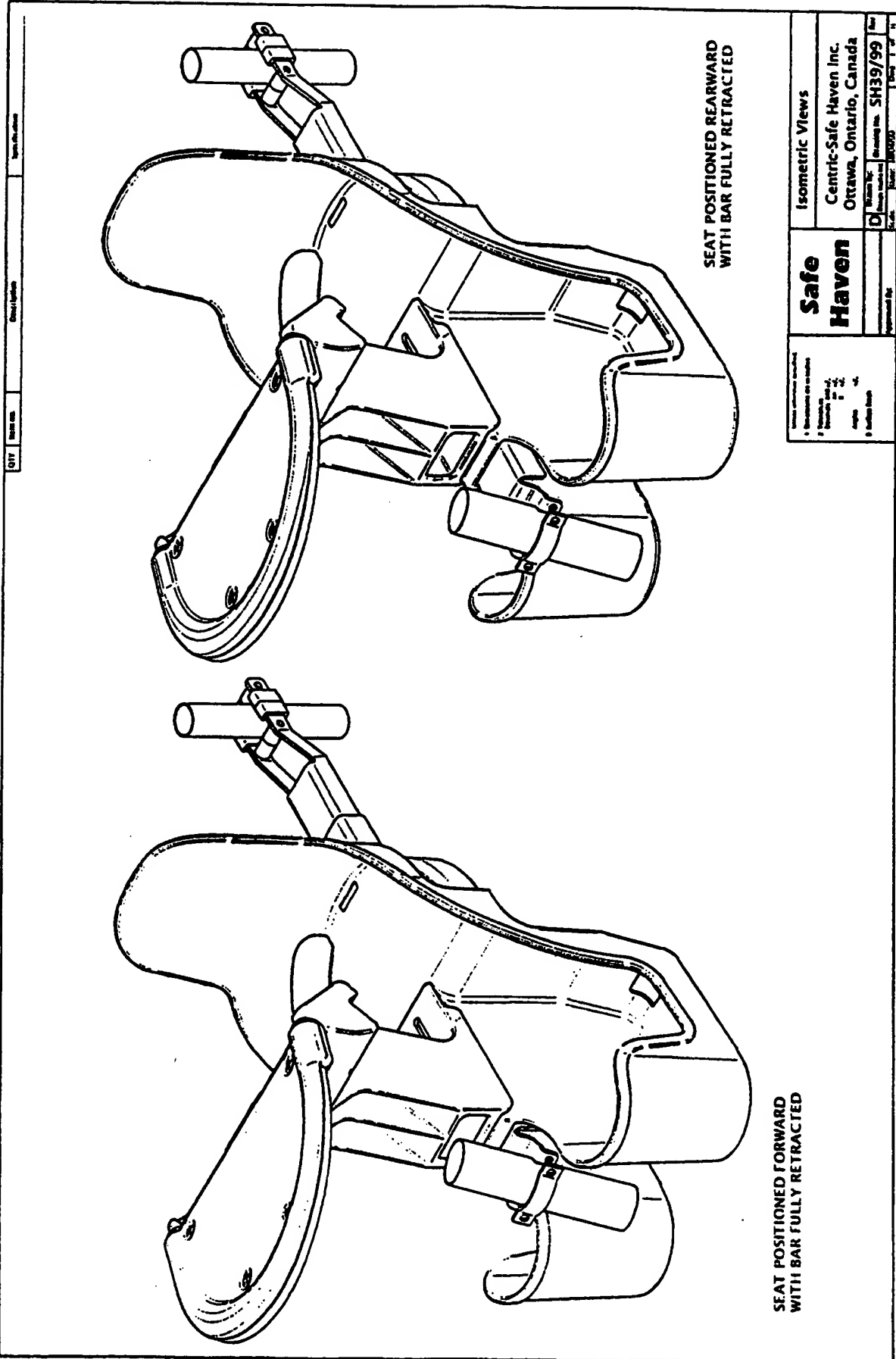
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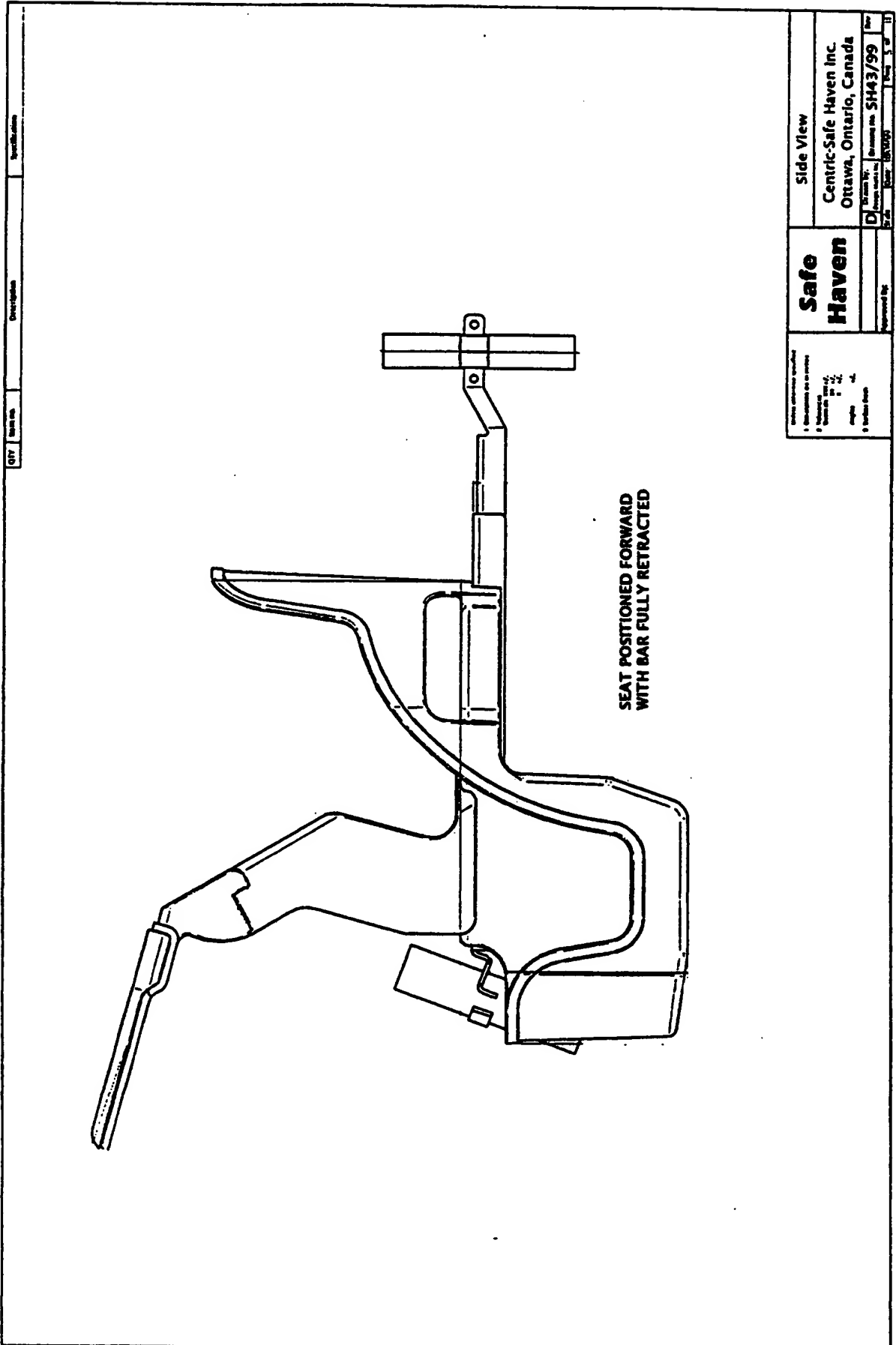
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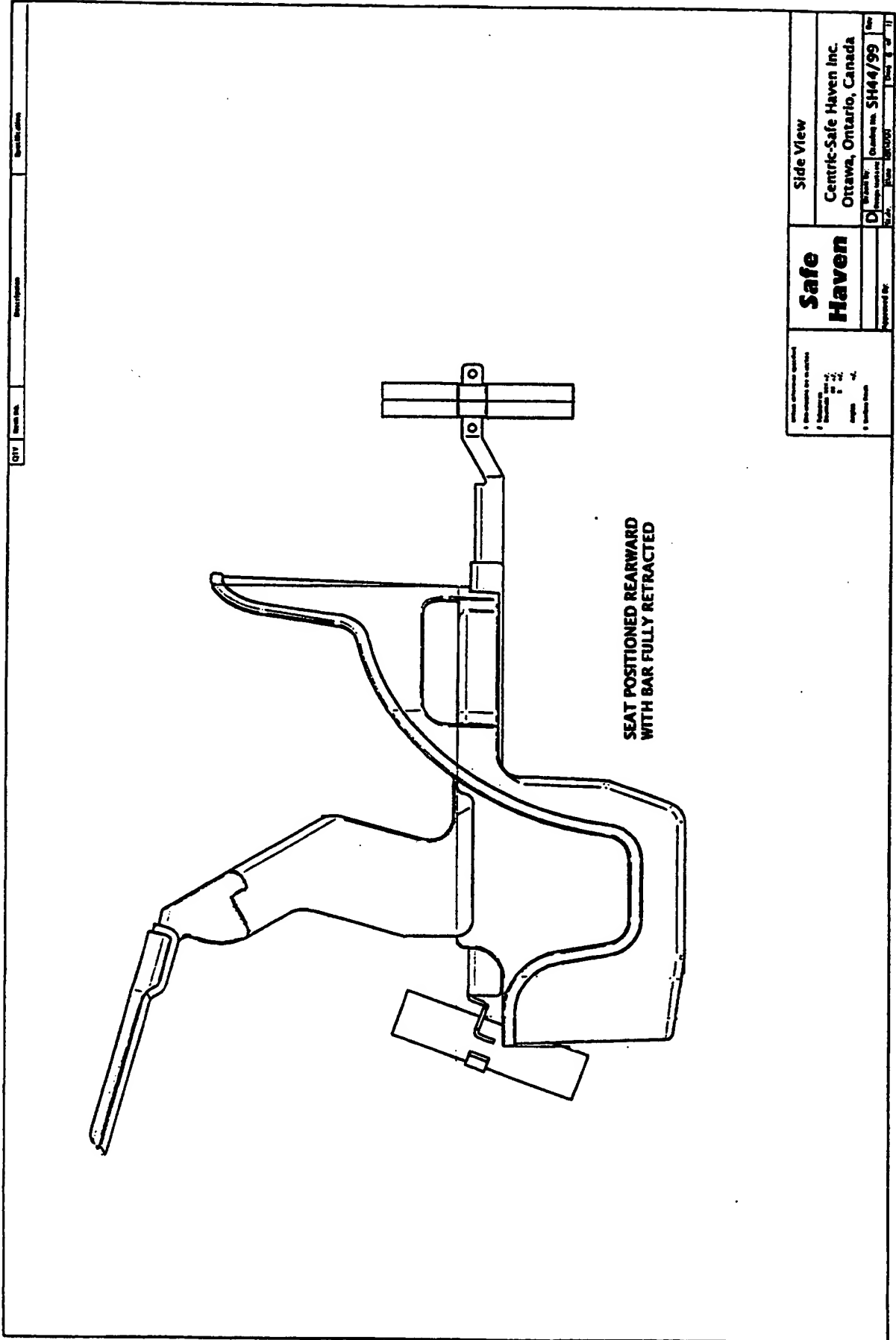


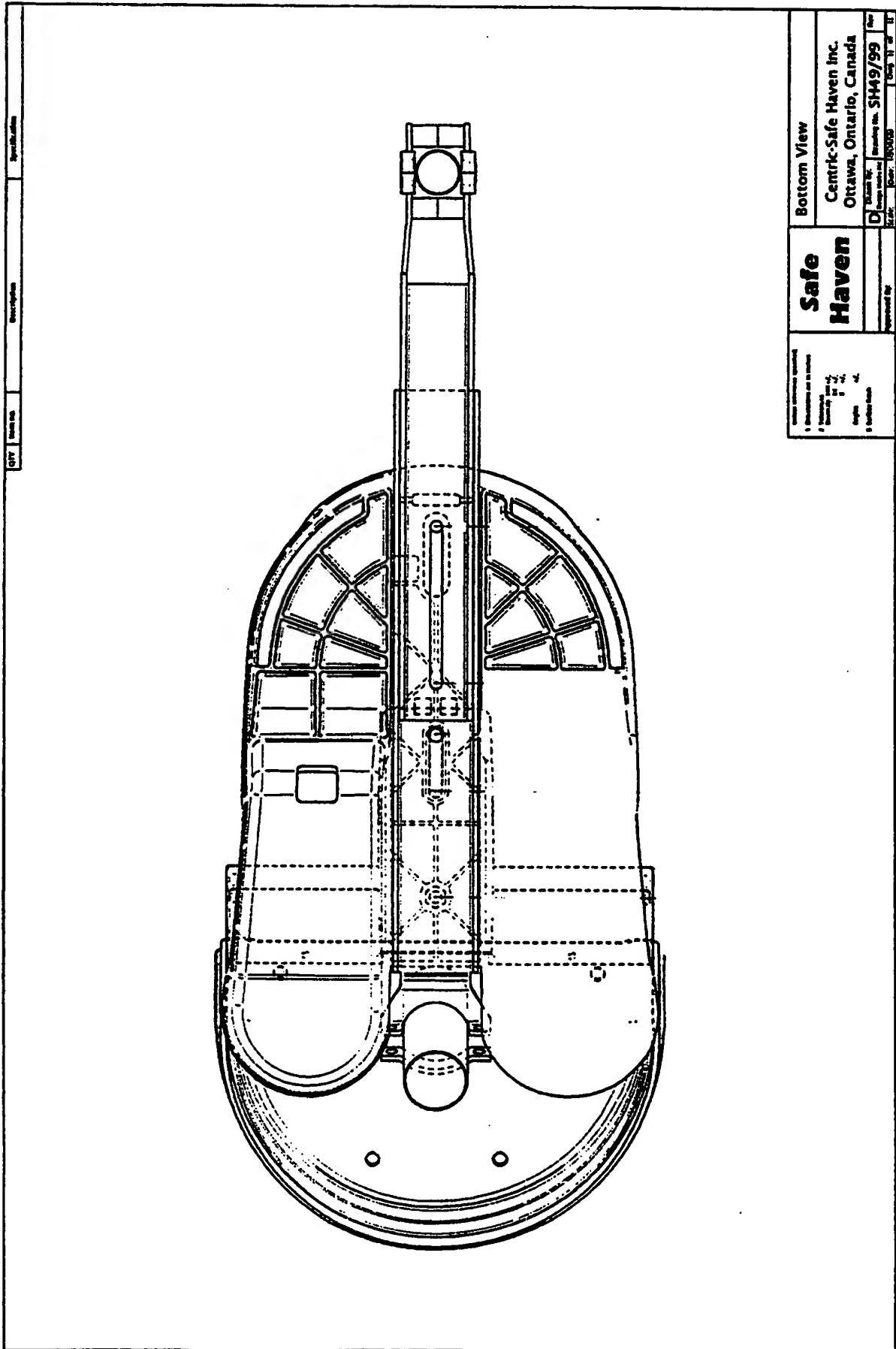


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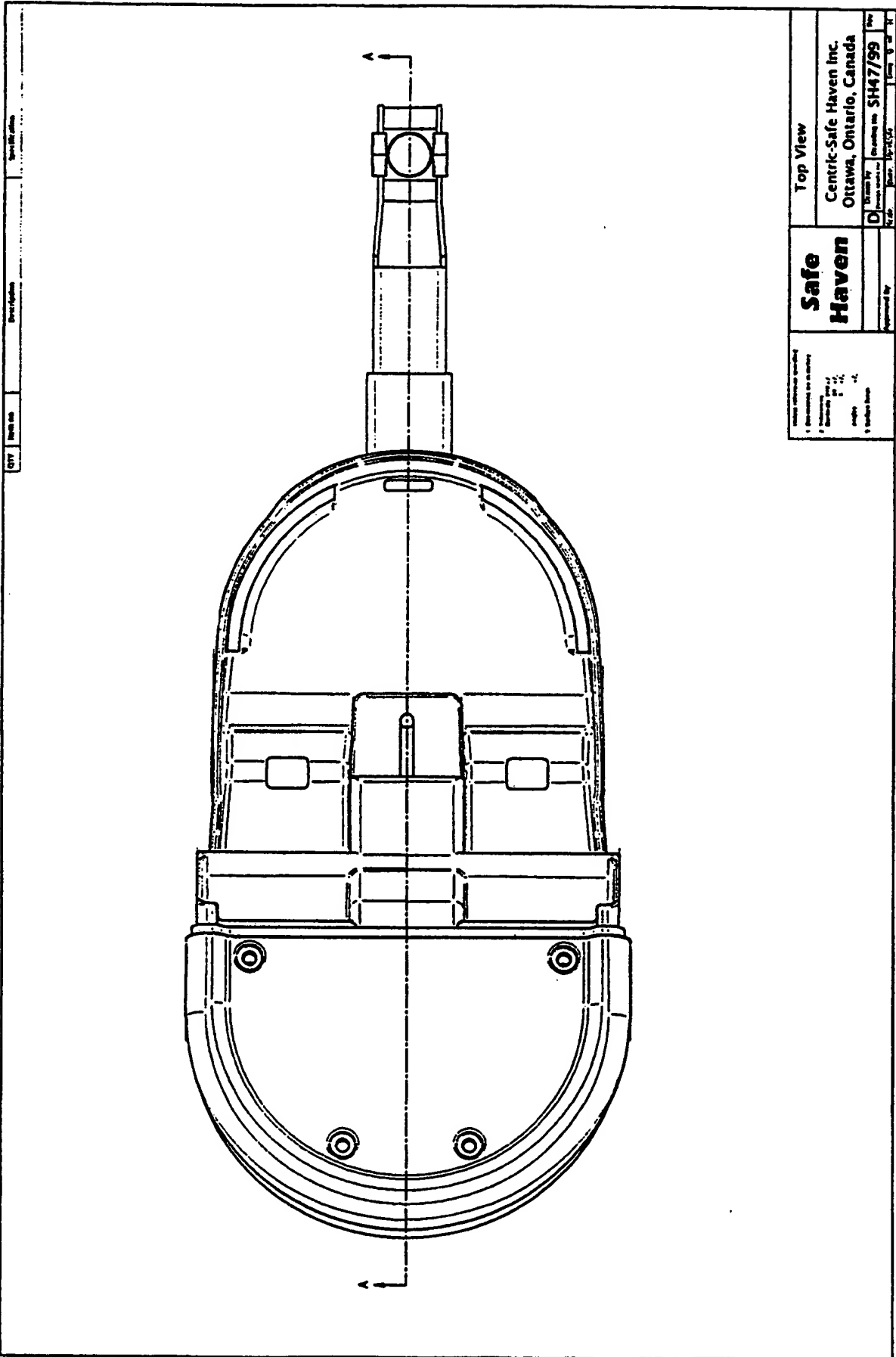


Safe Haven		Side View	
Centric-Safe Haven Inc. Ottawa, Ontario, Canada		Drawing No. SH43/99 Rev. 1 of 1	
Part No. _____ Description _____ Qty _____		Drawing No. SH43/99 Rev. 1 of 1	





Safe Haven		Bottom View	
1. Dimensions are in inches 2. Tolerances are as follows: Length .0005 Width .0005 Depth .0005 3. Surface finish		Centric-Safe Haven Inc. Ottawa, Ontario, Canada	
Approved by: _____ Date: _____		Drawing No. SH49/99 Rev. 1	



Safe Haven		Top View	
Centric-Safe Haven Inc. Ottawa, Ontario, Canada			
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